The Fibonacci numbers $(0,1,1,2,3,5,8,13,21,34,55, \ldots)$ are defined by the recurrence:

$$
\begin{aligned}
F_{0} & =0 \\
F_{1} & =1 \\
F_{i} & =F_{i-1}+F_{i-2} \text { for } i>1
\end{aligned}
$$

Write a program which calculates $M_{n}=F_{n} \bmod 2^{m}$ for given pair of $n$ and $m .0 \leq n \leq 2147483647$ and $0 \leq m<20$. Note that $a \bmod b$ gives the remainder when $a$ is divided by $b$.

## Input

Input consists of several lines specifying a pair of $n$ and $m$.

## Output

Output should be corresponding $M_{n}$, one per line.

## Sample Input

117
116

## Sample Output

89
25

